NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CROSS WIND RIDGES

(Ac.)
Code 588

Tillage being performed to create cross wind ridges.

DEFINITION

Ridges formed by tillage, planting or other operations and aligned perpendicular to prevailing wind direction during critical wind erosion periods.

PURPOSE

This practice supports one or more of the following purposes:

- Reduce soil erosion from wind – Resource concern (SOIL EROSION - Sheet, rill, & wind erosion).
- Protect growing crops from damage by windblown soil particles – Resource concern (DEGRADED PLANT CONDITION – Undesirable plant productivity and health).
- Reduce soil particulate emissions affecting air quality – Resource concern (AIR QUALITY IMPACTS - Emissions of Particulate Matter - PM - and PM Precursors).

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland with soils that are stable enough to sustain effective ridges and cloddiness, such as loamy and clayey soil materials.

It is not well adapted on soils with lower aggregate stability such as sandy soil materials and certain organic soils.

Table 1 on the following page lists the soil surface textures which fall into each wind erodibility group (WEG).

CRITERIA

General Criteria Applicable to All Purposes

Determine ridge orientation, height, spacing, and time period that ridges need to be present using the currently NRCS approved wind erosion prediction technology taking into account other practices in the conservation management system.

Orientation of the ridges should never exceed 45 degrees from perpendicular to the erosive wind direction during a critical wind erosion period.

Ridge spacing should never exceed 4 times the ridge height during wind erosion periods.

Evaluate impact to cultural resources, wetlands, and Federal and State protected species to avoid or minimized to the extent practical during planning, design, and implementation of this conservation practice. For more information, see established National and Florida NRCS policy, General Manual (GM) Title 420-Part 401, Title 450-Part 401, and Title 190-Parts 410.22 and 410.26; National Planning Procedures Handbook (NPPH, Handbooks Title 180 Part 600) FL Supplements to Parts 600.1 and 600.6; National Cultural Resources Procedures Handbook (NCRPH; Handbooks Title 190 Part 601); and The National Environmental Compliance Handbook (NECH, Handbooks Title 190 Part 610).

Table 1. Soils Suitable for Ridges

Wind Erodibility Group (WEG)	Soil Textures of Surface Layer	Soil Erodibility Index "I" Value
1	Very fine sand, fine sand, sand, or coarse sand	180 - 160
2	Loamy sand, loamy fine sand or sapric organic soil material	134
3	Very fine sandy loam, fine sandy loam, sandy loam	86
4	Clays, silty clays, noncalcarcous clay loams and slity clay loams with > 35% clay content	86

Additional Criteria to Protect Growing Crops from Damage by Wind-Borne Soil Particles

During those periods when sensitive crops are susceptible to damage by wind-borne soil particles, wind erosion should not exceed the crop tolerance to blowing soil as specified in the Florida Conservation Practice Standard Cross Wind Ridges, Code 588, Guidance, the Florida Erosion Control Handbook, and the National Agronomy Manual (Manuals Title 190, Table 502-1).

CONSIDERATIONS

To be most effective, cross wind ridges should be oriented perpendicular to the direction of erosive winds.

Transport of wind-borne sediment and sediment-borne contaminants offsite can be reduced by this practice when used in a resource management system.

Adjacent fields, roads, or field corners may need treatment to stop saltation of soil particles onto fields protected by cross wind ridges.

Cross wind ridges are most effective where the soil erodibility index (I) is 104 or lower. To be effective in coarse textured soils such as very fine sandy loams, fine sandy loams, sandy loams, and sand soils cross wind ridges should be established when soil is moist. Ridges on these soils will deteriorate quickly and shorten the protection period.

Cross wind ridges may be created at right angles to the predominant erosive wind direction on bare unprotected fields as a form of emergency tillage to reduce wind erosion. However, cross wind ridges

generally have a temporary impact on reducing wind erosion; which may not last throughout the critical wind erosion period.

Cross wind ridges are most effective when used in combination with other practices in a conservation management system to reduce wind erosion.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the selected conservation practice purposes, criteria, considerations, and operation and maintenance in this conservation practice standard.

Record practice design using an approved Implementation Requirements document.

At a minimum the following items should be documented:

1. Erosive Wind Direction
2. Critical Wind Period
3. Field Number(s)
4. Soil Map Unit
5. Crop
6. Soil Loss T or Crop Tolerance
7. Ridging Operation
8. Ridge Height
9. Spacing
10. Direction of ridges

OPERATION AND MAINTENANCE

Establish or re-establish ridges with equipment such as chisel plows, drills with hoe openers, or other implements that form effective ridges.

After establishment, maintain ridges through those periods when wind erosion is expected to occur, or until growing crops provide enough cover to protect the soil from wind erosion.

Re-establish ridges if they deteriorate and become ineffective due to weathering or erosion, or change in expected prevailing wind erosion direction, unless doing so would damage a growing crop.

REFERENCES

National Agronomy Manual

Florida Erosion Control Handbook

Skidmore, E.L. and N.P. Woodruff. 1968. Wind erosion forces in the United States and their use in predicting soil loss. USDA, Agriculture Handbook 346.

USDA, ARS. 2006. The wind erosion prediction system, (WEPS ver. 1.2.9), User Manual, 2011. Wind Erosion Research Unit, Manhattan, Kans.

USDA, NRCS. 2002. National Agronomy Manual. 190-V. 3rd ed., Part 502, Wind erosion.

USDA, NRCS. 1993. Soil survey manual. USDA Handbook 18.